Ropes - Alternative String Representation

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1 Introduction

In this paper we will discuss the Rope data structure, a data structure intended to serve as a more robust and more performant alternative to the tradtional String type offered in most languages. The seminal paper regarding Ropes was written by Hans-J. Boehm, Russ Atkinson and Michael Plass in 1995. We will provide an overview of their paper, beginning with their justification for Ropes in the first place. We will continue with a more technical recap of the implmentation details and running time guarantees of a rope. As an exercise we have implemented our own Rope and we will give some rough benchmark estimates comparing various operations. Finally, in order to more easily show off the Rope data structure, we will discuss a visualization we created that allows one to actively interact with a Rope data structure and visualize its internal structure.

2 Justification for Expanded String Type

Boehm, Russ and Plass begin their paper by discussing some of the faults of traditional string types and the various ways that they could be improved. We will provide a brief summary of their points.

Before attacking 'the traditional string type,' we must first define it. This traditional string type we refer to is the crude fixed length arrays of characters offered by languages such as C as Pascal.

3 Implementation and Running Time

Maybe splay trees don't work.

4 Benchmarking

We wrote some code.

5 Visualization

Text editors, wooo.